II. CHINOOK MANAGEMENT ASSESSMENT

South of Point Delgada

Management Goals and Preseason Expectations

Ocean regulations for chinook salmon fisheries south of Point Delgada (Shelter Cove) were based on management goals for Sacramento River fall-run chinook. Point Delgada was approved in 1984 as the management boundary for separating commercial fisheries for Sacramento and Klamath river fall-run chinook. The boundary in 1983 was Cape Vizcaino, located 21 nautical miles south of Point Delgada.

The 1985 spawning escapement goal for Sacramento River fall-run chinook was a range of 122,000 to 180,000 hatchery and natural adults combined. Approved ocean regulations for both ocean fisheries were the same as 1984. Projected ocean chinook salmon landings south of Point Delgada under approved regulations were 364,000 fish, including 278,800 in the troll fishery and 85,200 in the sport fishery. The anticipated spawning escapement in the Sacramento River was 169,900 fall-run adults.

Ocean Fisheries

Troll - Commercial trollers landed a total of 355,500 chinook salmon at ports south of Point Delgada. Comparative landings in 1984 and the 1971-1975 average were 271,500 and 384,800 chinook salmon, respectively (Figure II-1). Average weight of chinook (dressed, head on) in the landings was 12.5 pounds compared to 8.7 pounds in 1984 and an average of 11.0 pounds during 1971-1975.

Effort by trollers landing catches south of Point Delgada in 1985 totaled 53,000 days fished. Comparative effort in 1984 was 37,400 days. During 1978-1982, effort in the area averaged 54,800 days.

Recreational - Recreational salmon landings at ports south of Point Delgada totaled 116,800 chinook salmon (Figure II-1). These landings were 45 percent higher than preseason expectations and 45 percent higher than comparative 1984 landings (80,500), but were 74 percent of the 1971-1975 average (157,500). Recreational angler effort south of Point Delgada in 1985 totaled 120,500 angler days compared to 82,400 in 1984. The chinook salmon catch-per-day averaged 0.97 fish compared to 0.98 fish in 1984.

Inside Fisheries and Spawning Escapement

No estimates are available of total inland sport harvest within this management area.

Sacramento River Fall Chinook - A total of 204,700 fall chinook salmon adults spawned in the Sacramento River basin in 1985 (Figure II-2). This number of adults is 44,400 (28 percent) higher than the 1984 escapement (160,300) and 26 percent higher than the 1971-1975 average (162,100).

Sacramento River hatcheries spawned 28,400 adults, 26 percent below the record 1984 hatchery run (Figure II-2).

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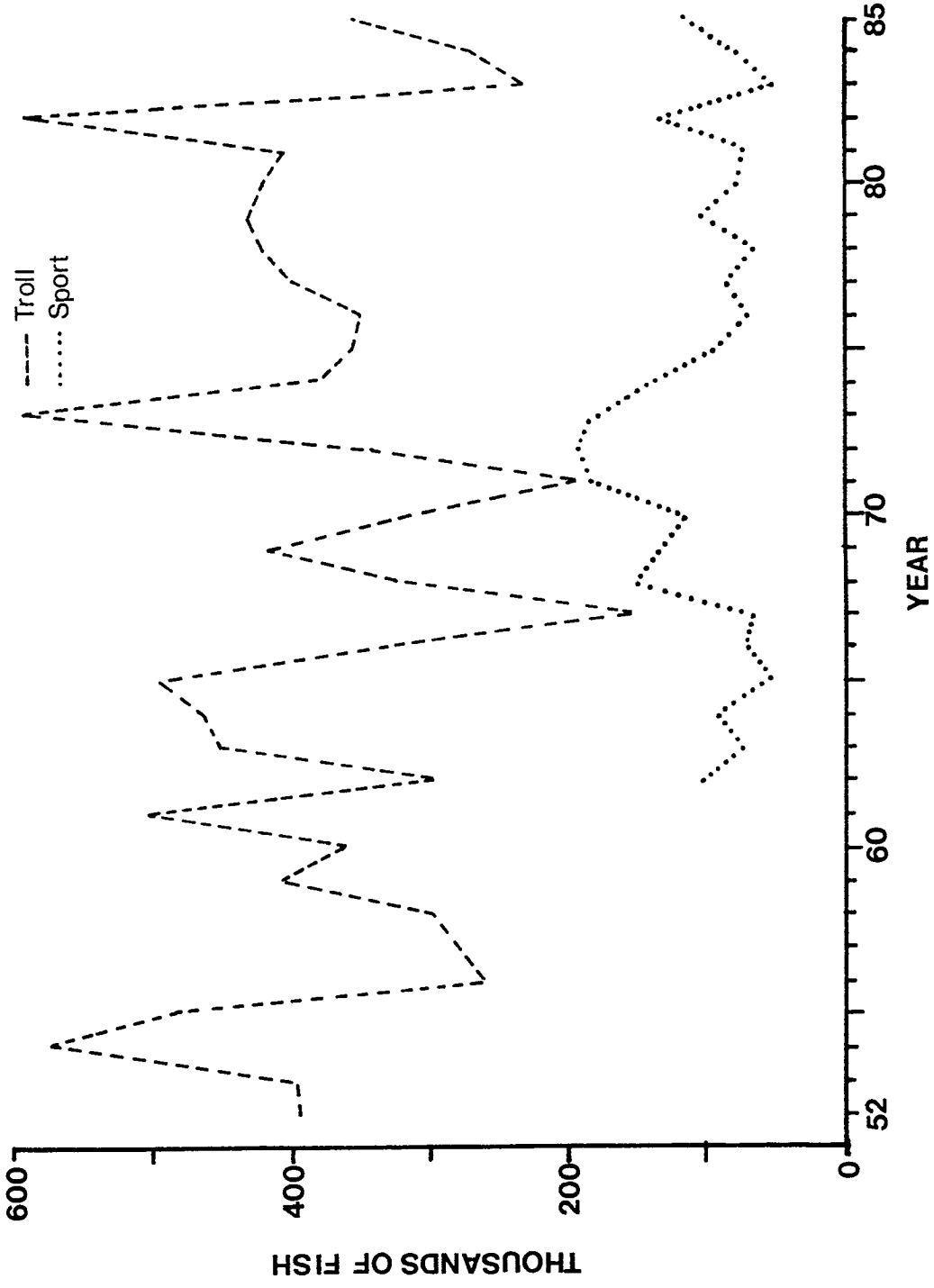

Figure II-1. Ocean chinook salmon landings south of Point Delgada by fishery, 1952-1985.

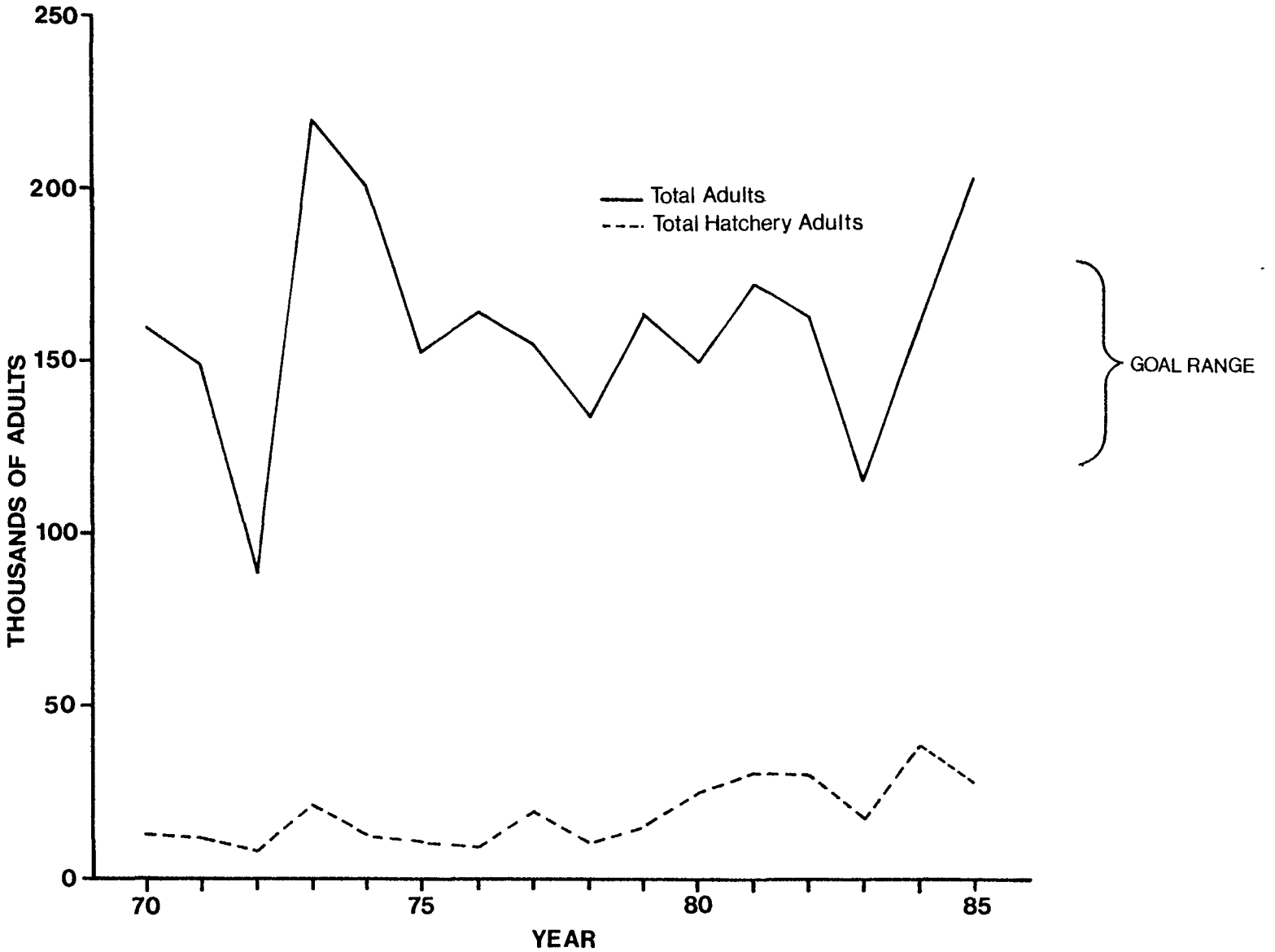

Figure II-2. Sacramento River adult fall-run chinook salmon escapements, 1970-1985, including hatchery counts and the 1985 escapement goal range.

The upper Sacramento River escapement (above Feather River) of 106,500 adults was the highest for the area since 1970. In 1985, 94,000 adults, 88 percent of the upriver run, spawned in natural areas. This was the highest naturally spawning population in this area since 1970. A total of 12,500 adults was spawned in the Coleman Hatchery. This was 35 percent below the 1984 record escapement to this facility.

The lower Sacramento River escapement of 98,200 adults increased by 14 percent over the 1984 escapement of 86,500 and was comparable to the 1971-1975 average of 103,700 adults. The 15,900 adults spawned in lower river hatcheries (Feather River and Nimbus) were 17 percent below the number of adults spawned at these same facilities in 1984. The 82,300 adults spawning naturally in lower river areas was 22 percent higher than the 1984 natural escapement of 67,400, but was 11 percent below the 1971-1975 average of 92,300.

For both the upper and lower rivers, the 1985 natural escapement increased significantly over 1984 while the hatchery escapements decreased (Table II-1).

Upper Sacramento River Late Fall, Winter, and Spring Chinook - Late fall chinook spawning in the upper Sacramento River in the winter of 1984-1985 totaled 7,900 adults; 1,400 fish (22 percent) greater than the 1984 adult escapement of 6,500, but only 45 percent of the 1971-1975 average of 17,700.

Spawning escapement of winter chinook salmon totaled 4,600 adults, 3,800 adults higher than the 1984 escapement (800), but only 20 percent of the 1971-1975 average of 22,500.

The spring chinook salmon run in the upper Sacramento River totaled 8,600 adults which was 4,900 fish (132 percent) higher than the 1984 run of 3,700 and 69 percent higher than the 1971-1975 average of 5,100.

San Joaquin River Chinook - Primarily fall chinook salmon utilize San Joaquin River spawning areas and hatcheries (Mokelumne River and Merced River). The estimated San Joaquin River fall chinook salmon spawning escapement in 1985 totaled 62,300 adults, the largest escapement to the area since 1970. Of the total escapement, 1,400 fish (2 percent) were spawned in the two basin hatcheries and 60,900 (98 percent) spawned naturally.

Goal Assessment

Indices of ocean harvest rate and population size of Central Valley chinook have been developed since 1970 based on ocean troll and sport landings south of Point Arena and Central Valley adult chinook salmon spawning escapements. Central Valley chinook stocks probably comprise 85 to 95 percent of catches south of Point Arena. The 1985 abundance index for Central Valley chinook is 607,100 fish, the second highest since 1974. For 1985, the harvest rate index is 0.52 (Table II-2, Figure II-3). This is 10 percent below the 1984 harvest rate index (0.58) and is the lowest index value since 1970.

The total spawning escapement of Sacramento River fall adult chinook salmon in 1985 was 204,700. Ocean regulations for chinook salmon fisheries south of Point Delgada were successful in meeting the 1985 escapement goal for the

Table II-1. Sacramento River natural and hatchery fall chinook escapements in 1984 and 1985 compared with the 1971-1975 average (thousands of fish).

Area	Stock	Fall Chinook Escapement 1971-1975 Average	1984	1985
Upper River	Hatchery	1.8	19.2	12.5
	Natural	56.5	54.6	94.0
	Subtotal	58.3	73.8	106.5
Lower River	Hatchery	11.5	19.1	15.9
	Natural	92.3	67.4	82.3
	Subtotal	103.8	86.5	98.2
Total	Hatchery	13.3	38.3	28.4
	Natural	148.8	122.6	176.3
	Grand Total	162.1	160.9	204.7

Table II-2. Indices of annual abundance and ocean fishery impacts on California Central Valley chinook, 1970-1985 (thousands of fish).

Year	Ocean Chinook Landings South of Point Arena			Hatchery and Natural Escapements of Central Valley Adults			Abundance Index (Ocean + River Totals)	Ocean Harvest Rate Index (%)[b/]
	Troll	Sport	Total	Fall	Other[a/]	Total		
1970	226.8	111.1	337.9	190.5	55.6[c/]	246.1	584.0	58
1971	150.7	166.3	317.0	190.6	62.0	252.6	569.6	56
1972	229.8	187.6	417.4	89.6	46.1	145.7	563.1	74
1973	422.7	180.9	603.6	227.1	27.1	254.2	857.8	70
1974	282.7	141.6	424.3	205.6	35.7	241.3	665.6	64
1975	234.4	92.7	327.1	159.2	47.6	206.8	533.9	61
1976	237.8	68.6	306.4	168.8	43.8	212.6	519.0	59
1977	263.9	77.3	341.2	155.7	42.8	198.5	539.7	63
1978	291.0	68.2	359.2	136.9	17.1	154.0	513.2	70
1979	233.3	96.3	329.6	167.9	11.3	179.2	508.8	65
1980	294.3	76.2	370.5	155.9	31.6	187.5	558.0	66
1981	289.9	72.5	362.4	188.4	18.7	207.1	569.5	64
1982	418.4	128.3	546.7	173.7	36.8	210.5	757.2	72
1983	178.2	52.3	230.5	121.5	12.4	133.9	364.4	63
1984	221.7	79.5	301.2	203.9	17.5	221.0	522.2	58
1985	205.9	111.5	317.4	267.0	22.7[d/]	289.7	607.1	52

a/ Spring run of the current calendar year and late-fall and winter runs of the following calendar year.
b/ Total ocean harvest as a percent of the abundance index.
c/ Comprised of 1970 brood year springs plus 1971 brood year winters and late falls. Percent of adults in 1979 spring run assumed the same as 1971 (72 percent, 5,500 total).
d/ Percent of adults in 1985 late fall and winter assumed the same as 1984 (5,500).

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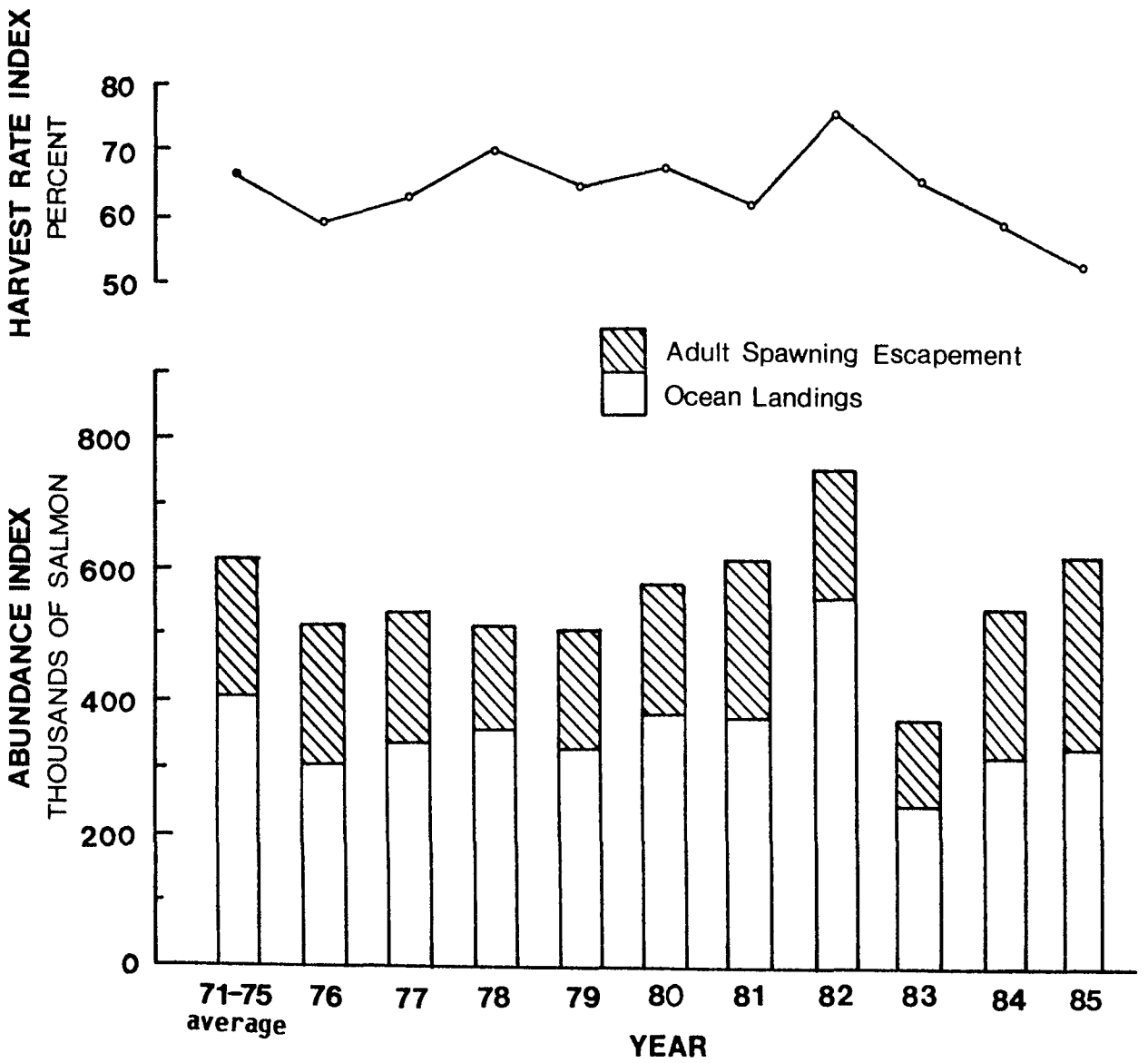

Figure II-3. Indices of annual abundance and ocean harvest rate of California Central Valley chinook salmon, 1970-1985.

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Sacramento River (122,000-180,000 fall adults) and provided for an ocean fishing season lasting nine months for recreational anglers and five months for commercial trollers.

Point Delgada to Cape Blanco

Management Goals and Preseason Expectations

Ocean regulations for chinook salmon fisheries between Point Delgada (Shelter Cove) and Cape Blanco were based on management goals for chinook salmon stocks in local streams, particularly the Klamath and Rogue rivers. A rebuilding schedule was in place for Klamath River fall chinook. The schedule called for an average inriver run size of 68,900 fall adults during 1983-1986. At the start of the 1985 season, the average inriver run-size level necessary to maintain the schedule during 1985-1986 was 87,200 fish since ocean escapements in 1983 and 1984 totaled only 57,900 and 43,300 fish, respectively. Individual river system goals were not in place for the other California coastal chinook salmon streams. Important contributors among these other streams are the Eel, Smith, and Mad rivers.

All Oregon coastal chinook streams were managed under an aggregate escapement goal of 150,000 to 200,000 adults, including all natural fall and spring stocks. South migrating Oregon coastal chinook stocks that spend their ocean life off southern Oregon and northern California are of particular importance to southern Oregon and northern California fisheries. These include spring chinook from the Umpqua River, and spring and fall chinook from areas south of Elk River, including the Rogue and Chetco rivers.

Local southern Oregon and northern California chinook were managed as a unit in 1985. There was no provision for commerical fishing between Point Delgada and Cape Blanco from May through September in 1985 because of concerns for local stocks, particularly Klamath River chinook. Late season (October to November) troll fisheries for chinook were provided in Oregon territorial waters off the mouths of the Elk and Sixes rivers. Oregon and California sport seasons in the zone were slightly less retrictive than they were in 1984. The Oregon season lasted 115 days while the California season was continuous from February 16 to November 17 (263 days) except for Monday and Tuesday closures from July 19 to August 31. These closures were implemented by the California Fish and Game Commission in response to unexpectedly high chinook catches in the area and the depressed status of Klamath River chinook.

Preseason expectations for ocean sport fisheries and stock status of southern Oregon chinook stocks are summarized in the Council's 1985 stock status projection report. Projected ocean sport chinook salmon landings between Point Delgada and Cape Blanco under approved 1985 regulations were 20,800. The expected ocean escapement into the Klamath River was 55,700 fall-run adults. A spawning escapement of 150,000 to 200,000 chinook salmon adults was expected to be met in the aggregate for all Oregon coastal streams.

Ocean Fisheries

Troll - Ocean commercial salmon fishing was not permitted in this management area during the general troll fishing season of May through September. Commercial landings in this area from catches made outside this closed zone

during May through September totaled 5,200 chinook (4,800 in California and 400 in Oregon) (Figure II-4). Effort by trollers landing catches between Point Delgada and Cape Blanco during May through September totaled 500 vessel days.

The late season troll fishery (October 1 through November 30) in Oregon territorial waters (Humbug Mountain to Cape Blanco) harvested 700 chinook in 300 vessel days in the Elk River area.

Recreational - Recreational chinook salmon landings at ports between Point Delgada and Cape Blanco totaled 79,900; 59,100 fish (284 percent) higher than preseason expectations (Figure II-4). The landings were up 47,400 fish (146 percent) from the previous record landing in 1977 of 32,500 and up 59,600 (294 percent) from the 1974-1978 average of 20,300.

Recreational effort in 1985 totaled 124,000 angler days compared to 79,200 days in 1984. The chinook salmon catch per day was 0.64. The previous high catch per day since 1978 was 0.27 chinook per day in 1982.

Inside Fisheries and Spawning Escapements

Klamath River Chinook - The estimated inriver run size of fall chinook salmon in the Klamath River in 1985 was 59,300 adults (Figure II-5), 6 percent above preseason expectations and 37 percent above 1984.

Klamath River fisheries harvested 15,400 adults, which was the second lowest inriver landing for the basin since comprehensive fishery monitoring began in 1978 (Table II-3). The Indian fishery harvested 11,600 chinook, 20 percent of the adult run size and 31 percent below the 1978-1984 average landing for this fishery (16,800). Recreational fisheries landed 3,800 adult chinook, 6 percent of the adult inriver run size. Both terminal fisheries were stopped earlier than scheduled because of higher than expected harvest levels. The spawning escapement of 43,900 adults was 93 percent higher than 1984 (22,700). However, the natural escapement of 22,800 was the second lowest since 1978. The hatchery spawning escapement of 21,200 adults was 7,100 fish higher than 1983, the previous high hatchery escapement since 1978 (14,100).

The Trinity River spawning escapement continued to be depressed in 1985 with adult escapements of 1,800 hatchery and 6,300 natural spawners.

The Shasta River is the most important chinook salmon spawning stream in the upper Klamath River. Counts of chinook salmon spawners in the Shasta River date from 1930. Complete counts are available for the years 1930-1937 and 1957-1985 (Figure II-6). Disregarding years of no counting or partial counts, the 1985 count of 2,900 adults was the fourth lowest recorded, and was 46 percent of the 1971-1975 average of 6,300. The Shasta River supported a run of 30,700 adults as recently as 1964 and historically received as many as 63,700 adults.

Other Northern California Chinook - Routine sampling of natural (non-hatchery influenced) spawning areas in coastal streams outside of the Klamath basin has been limited to Sprowl Creek, a tributary to the South Fork Eel River near Garberville; and Canon Creek, a tributary to the lower Mad River above the North Fork. Indices of spawner abundance (peak counts) have been available

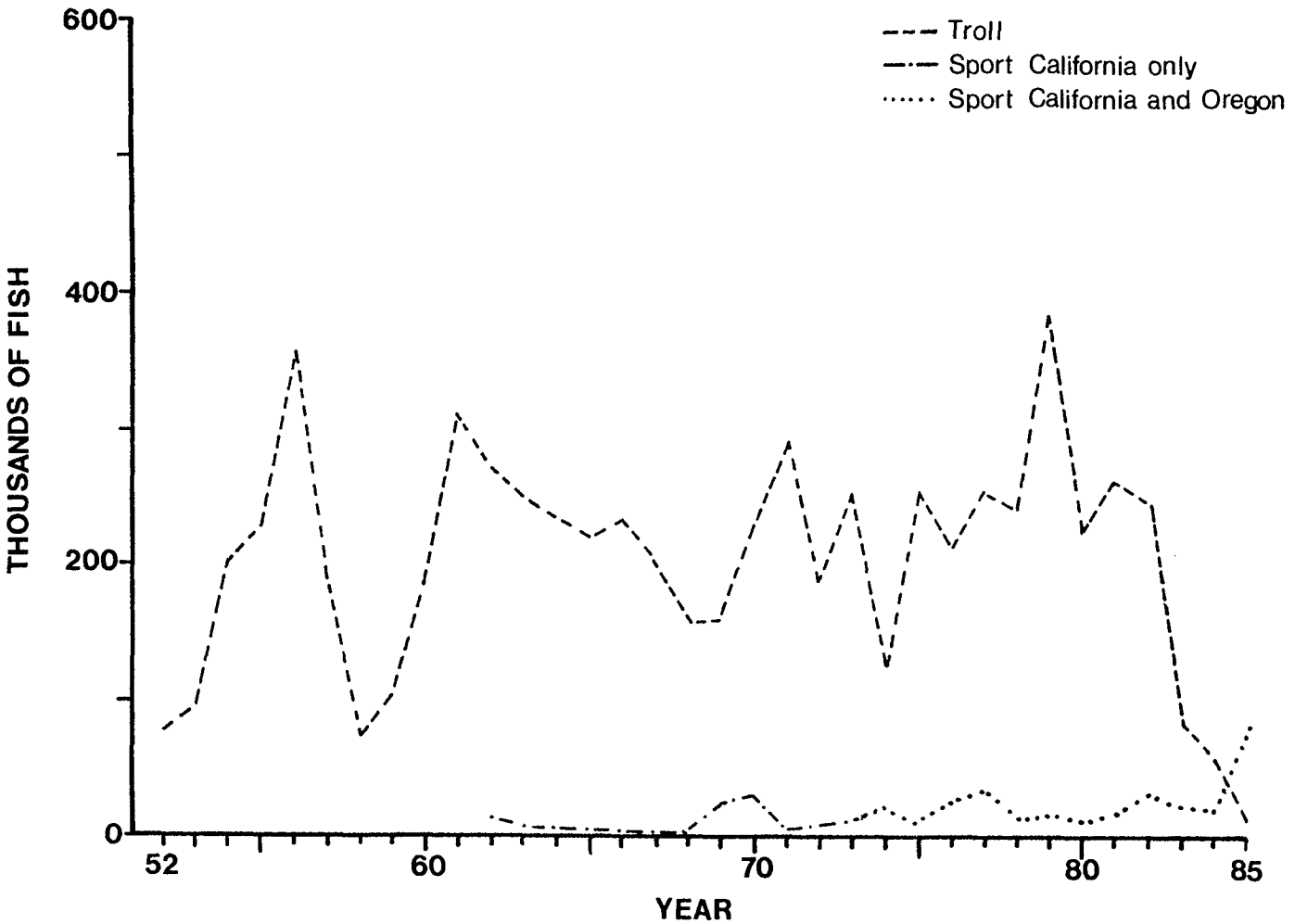

Figure II-4. Ocean chinook salmon landings between Cape Blanco (southern Oregon) and Point Delgada (Shelter Cove) by fishery, 1952-1985.

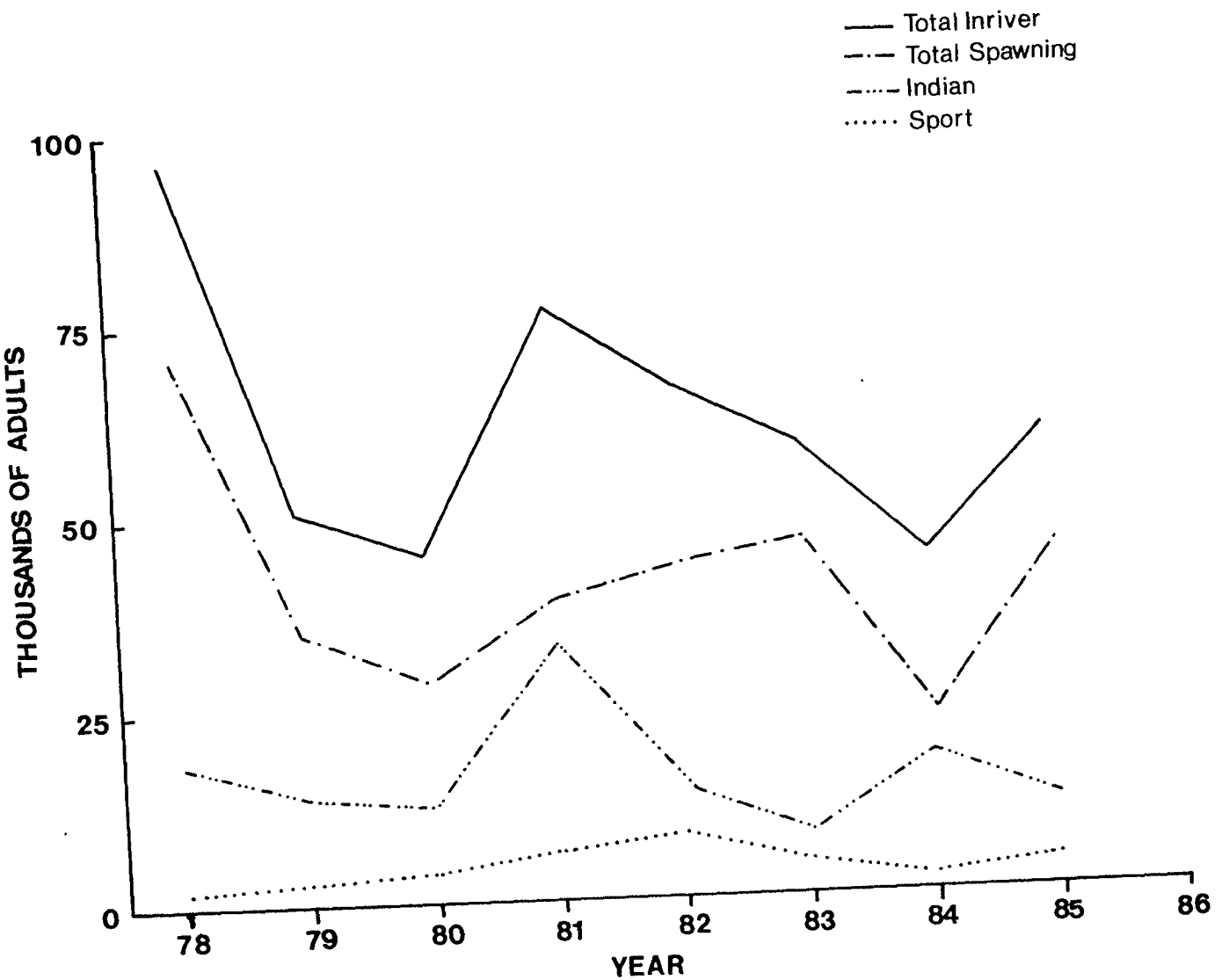

Figure II-5. Klamath River adult fall-run chinook salmon escapements and inland landings, 1978-1985.

Table II-3. Klamath River adult inriver fall chinook run size, spawning escapement, sport catch, and Indian net harvest (in numbers and percent of the total inriver run size), 1978-1985.

	Spawning Escapement		River Sport Catch		Indian Net Catch		Inriver Run Size
Year	Numbers	Percent	Numbers	Percent	Numbers	Percent	Numbers
1978	71,500	78	1,700	2	18,200	20	91,300
1979	34,300	68	2,100	4	13,700	27	50,100
1980	28,000	63	4,500	10	12,000	27	44,500
1981	38,300	49	6,000	8	33,000	43	77,300
1982	42,400	65	8,300	13	14,500	22	65,200
1983	45,700	79	4,300	7	7,900	14	57,900
1984	22,700	52	2,100	5	18,500	43	43,300
1985[a/]	44,000	74	3,800	6	11,600	20	59,300

a/ Preliminary.

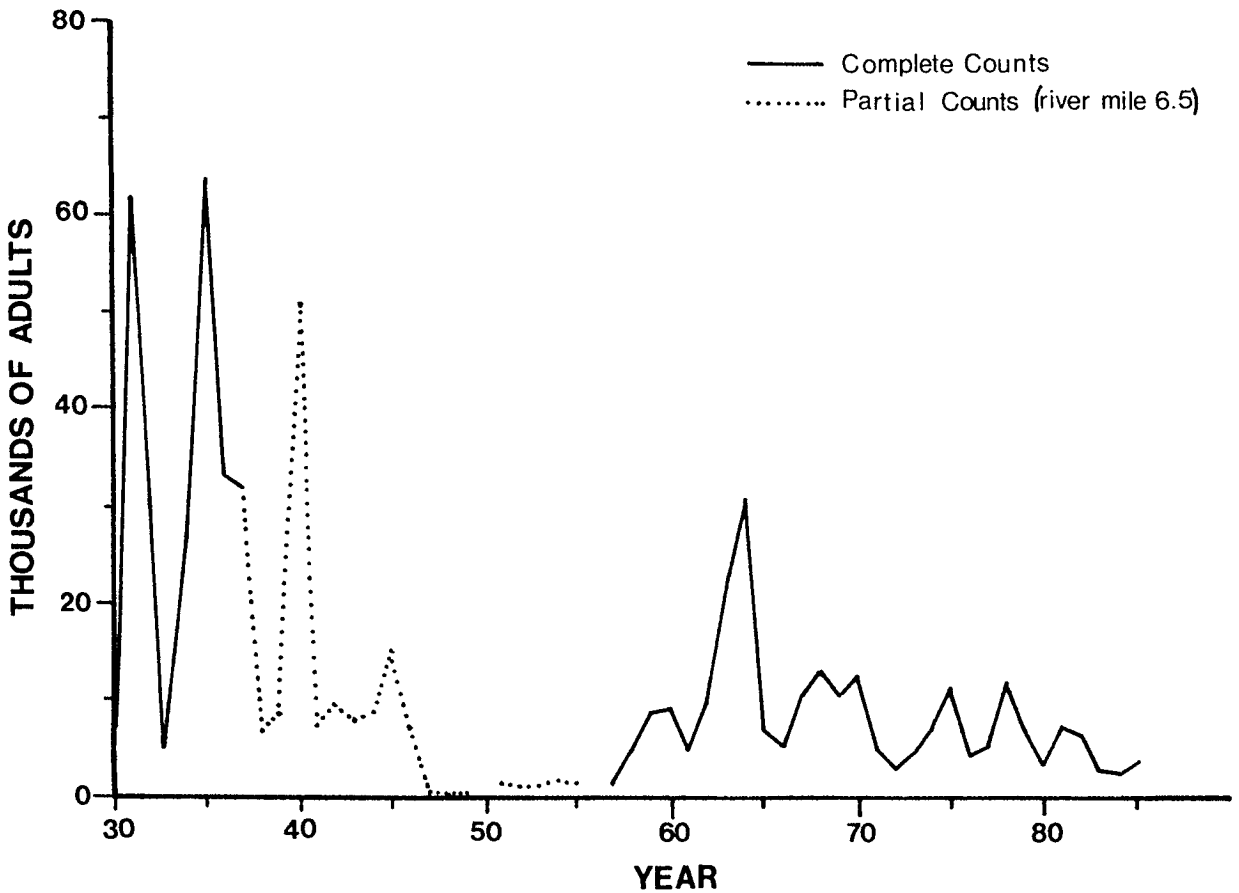

Figure II-6. Shasta River adult fall-run chinook counts, 1930-1985.

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since 1963 whenever stream conditions during the December and January peak spawning period permitted relatively consistent counting of live and dead spawners (adults and jacks combined). Counts in years of poor visibility have not been included in the data base.

Peak spawner counts in Sprowl and Canon creeks have fluctuated widely since 1963 (Appendix B, Table B-7). The 1963-1984 averages were 348 and 115 chinook, respectively. The 1985 counts were 304 in Sprowl Creek and 494 in Canon Creek.

Southern Oregon Chinook - Inside harvests of fall and spring chinook in southern Oregon streams are limited to sport-caught fish. No commercial (gillnet) or Indian fisheries exist in these streams. Historically, major sport harvest has been confined to the Umpqua, Rogue, and Chetco rivers, with minor catches in smaller streams. For 1977-1980, the yearly average inriver sport chinook harvest for significant area streams was approximately 15,600 fish. Harvest for these streams during 1983 and 1984 was considerably lower than the 1977-1980 average and influenced by the negative impacts on stock abundance from El Nino ocean conditions and flooding conditions in the river in the winter of 1981-1982. Inside recreational harvest for 1985 is not available, but is believed to have improved substantially over 1983-1984 landings based on much higher indices of inriver run sizes in the Rogue and Umpqua stocks.

Spawning ground escapement data for southern Oregon index streams south of the Elk River are not extensive and, alone, do not provide sufficient information on which to develop an assessment of run strength for local systems (see Appendix B, Table B-8). Three indicators of overall stock abundance are presently utilized: (1) Rogue River spring chinook counts at Gold Ray Dam (1942-1984), (2) Rogue River fall chinook catch of adults and jacks per seine haul in the lower river (1974-1984), and (3) Umpqua River spring chinook counts at Winchester Dam (1946-1984) (Appendix B, Tables B-9 and B-10). These three indicators of chinook escapement trends were stable prior to 1983, but showed significant declines in 1983 and 1984 as a result of El Nino impacts.

In 1985, the Rogue River spring chinook spawning escapement over Gold Ray Dam was 25,400 adults, 193 percent above the depressed 1984 return of 8,700 adults, and 25 percent above the 1971-1984 average adult escapement. Umpqua River wild spring chinook counted over Winchester Dam totaled 9,900 adults, a 94 percent increase over the 1984 escapement of 5,100 adults, and 36 percent above the 1971-1984 average of 7,300 fish. In both river systems the hatchery and wild components improved dramatically.

Rogue River fall chinook inriver escapement, as assessed by seining studies (number of fish caught per seine haul in the lower river at mile 8), indicated 1985 adult returns of 0.56 fish per haul, 133 percent above the 1984 index which was the lowest since seining began in 1974. The 1985 adult index was still only 48 percent of the 1975-1984 average (1.07). The jack seining index was 338 percent above the 1984 index and 43 percent above the 1975-1984 average.

Large increases in southern Oregon chinook escapements in 1985 were the result of no ocean troll fishery between Cape Blanco and Point Delgada and increased survival following El Nino impacts.

Goal Assessment

Klamath River Chinook - Ocean regulations since 1983 have not been effective in meeting the ocean escapement goals for Klamath River chinook. The Council's management goal for Klamath River fall chinook is to achieve an average ocean escapement of 68,900 adults during 1983-1986. Inriver run sizes have been below target levels each year since 1983 and have required the escapement level to be increased to a 72,600 average during 1984-1986 and an 87,200 average during 1985-1986. In order to meet the goal in 1986 the inriver run size for the Klamath River must total 115,100 adults.

Southern Oregon Chinook - Returns of fall chinook salmon to southern Oregon coastal hatcheries met Oregon Department of Fish and Wildlife (ODFW) program egg-take goals for smolt production in 1985. Spring chinook program goals of ODFW for smolt production were met at all stations. The overall aggregate Oregon coastal goal of 150,000 to 200,000 natural spawning adults was probably met. A summary of chinook returns to coastal hatcheries since 1972 is shown in Table III-3.

Cape Blanco to Cape Falcon

Management Goals and Preseason Expectations

The ocean chinook fisheries from Cape Blanco to Cape Falcon are managed primarily for chinook stocks produced within the area. These include local fall and spring stocks of both hatchery and wild origin as well as "localized" southern Oregon stocks originating south of Cape Blanco. Lesser numbers of California fall chinook and Columbia River chinook also contribute to catches in this area.

The management goal for Oregon coastal chinook stocks is to achieve a total natural chinook spawning escapement of 150,000 to 200,000 adults. Implicit within this goal is the desire to maintain both localized and north migrating stocks at recent historic average escapement levels prior to El Nino conditions. Most of the chinook produced in this management area migrate north and contribute to ocean fisheries off Oregon, Washington, British Columbia, and Alaska.

The general expectation for 1985 was for a continuation of recent stable abundance levels based on strong parental year escapement, average freshwater environmental conditions, and observations that El Nino had less effect on these far-north migrating stocks than on south distributed stocks.

Ocean Fisheries

Troll - The troll fishery in this area opened May 1 and continued through October 31. Effort from Cape Blanco to Cape Falcon was 19,600 vessel days, 317 percent above the 1984 level and 65 percent of the 1979-1982 average (Appendix A, Table A-6, A-7, and A-9). Troll landings were 206,700 chinook, 479 percent of the 1984 catch, and 82 percent above the 1979-1982 average of 113,300 chinook. The average weight of a troll caught chinook (dressed, head on) was 9.5 pounds for the July through August period compared to 8.35 pounds in 1984 (Appendix D, Table D-2).

An additional late season fishery from November 1 through November 30 was open from Tower Rock to Cape Blanco (Sixes River area). Vessel effort was 178 fishing days with a catch of approximately 950 chinook based on sampling data.

Recreational - The 1985 season was opened July 1 through September 2 in the Cape Falcon to Cape Blanco area compared to the shorter 1984 season of July 9 through August 17. The ocean recreational fishery exerted 172,700 angler days of effort, 60 percent above the 1984 level and 10 percent less than the 1979-1982 average (Appendix A, Table A-10). Recreational catch was 16,200 chinook, 103 percent above the 1984 catch and 64 percent above the 1979-1982 average catch of 9,900 fish.

Oregon opened a small all-species-except coho ocean recreational fishery from Twin Rocks to Pyramid Rock around the mouth of Tillamook Bay from September 15 through October 31. This fishery was to provide some harvest opportunity on returning fall chinook to area streams. It was estimated that 609 ocean angler trips were taken with an estimated catch of 66 chinook. However, sampling analysis indicates 2,650 angler trips that fished a combination of both ocean and bay areas on the same trip.

Inside Fisheries

Commercial inside chinook harvest within the Cape Falcon to Cape Blanco area is limited to private aquaculture operations. A total of 9,900 adult and 25,300 jack chinook salmon returned to aquaculture facilities (Table II-4). The only other estuary and river harvest within the area is from recreational effort. No estimate of this harvest is available for 1985. However, the 1978-1980 average yearly estuary/river recreational chinook harvest was estimated to be 31,200 chinook (fall and spring runs) as determined from salmon tag (punch card) returns. A special 1985 creel census program for Tillamook Bay (September and October) indicated 18,700 angler trips and a catch of 1,400 chinook.

Spawning Escapement

Ocean fisheries for Oregon coastal fall chinook stocks are managed to achieve an overall coastal escapement goal range of 150,000 to 200,000 naturally spawning adults. Spawning escapement goals for individual stocks in the Cape Falcon to Cape Blanco region representing the Oregon coastal north-migrating chinook (Elk River to Nehalem River) have not yet been developed. Twenty-two Oregon coastal river systems are known to contribute fall chinook to inside recreational fisheries and to ocean fisheries mainly north of Oregon.

An index of spawning adults (peak count per index mile) in ten index streams is used to measure wild spawning escapement trends for these chinook stocks. These data have been collected since about 1950 for most systems (Appendix B, Table B-11).

For 1985, a preliminary estimate of peak adult index spawning counts indicates returns were at an historic high of (132 fish per mile) (Appendix B, Table B-12). The record high 1985 escapement, as measured by the index, may be the result of a combination of increased survival and more restrictions to the north, both in the Council area and under provisions of the U.S.-Canada

Table II-4. Number of salmon returned to Oregon private hatchery facilities, 1978-1985.

Species	1978	1979	1980	1981	1982	1983	1984	1985[a/]
Chinook Adults	213	271	752	2,588	7,456	5,117	3,571	9,935
Chinook Jacks[b/]	31	145	2,642	2,499	4,426	914	2,728	25,328
Coho Adults	8,069	48,497	39,182	111,264	176,936	138,108	114,905	309,688
Coho Jacks[c/]	3,852	674	4,202	6,575	7,785	835	490	18,845
Chum	539	14	545	477	1,132	515	821	3,246

a/ Preliminary.
b/ Number of chinook jacks include adults less than 24 inches in length.
c/ Biological coho jacks only (separated from small adults by scale analysis).

salmon treaty ratified in 1985. While no escapement goal has been established for these streams, ODFW believes recent year escapements are at or above the optimum escapement levels.

Goal Assessment

Preliminary assessments of 1985 data indicate that the overall coastal escapement goal of 150,000 to 200,000 adults was met. Escapements of northerly migrating stocks were at a record high. Returns of hatchery fall and spring chinook to central and northern Oregon coastal hatcheries met ODFW program goals for smolt production and are summarized in Table III-3.

North of Cape Falcon

Management Goals and Preseason Expectations

Ocean fishery management for chinook salmon in the area north of Cape Falcon during the 1985 season primarily addressed projections for low abundance of the Spring Creek hatchery fall chinook stock. Upper and lower Columbia River hatchery fall chinook stocks are major contributors to ocean troll and sport fisheries from Cape Falcon to Vancouver Island. The expectation of low abundance for 1985 suggested that ocean and inriver fisheries would need to be restricted in order to achieve the hatchery escapement goal for the Spring Creek stock. Quotas established for fisheries in this area reflected this specific stock's expected total abundance, its expected relative contribution to the catch of all chinook stocks, agreements among ocean fishing groups, and management plan agreements for inriver fisheries. The management objectives directed at the Spring Creek fall stock were expected to indirectly provide additional protection for other depressed Columbia River chinook stocks, including upper river spring and natural summer stocks. These stocks are known to have a more northerly ocean distribution than the Spring Creek stock and the impact of fisheries in the area of concern is very minor, in terms of their total fishery harvest or relative to their total abundance.

Non-treaty recreational and troll fishery chinook harvest sharing in ocean areas north of Cape Falcon is determined annually according to the framework plan schedule which is based on historic catches.

Ocean Fisheries

Non-treaty Troll - The all-salmon-except-coho fishery began May 1 and was closed on May 14 when inseason information suggested that the 27,000 fish harvest quota had been reached. The fishery reopened on May 21 after landing information revealed the total catch for the initial period was approximately 10,000 fish less than the quota. The fishery closed as originally scheduled on May 31 and the total harvest was 27,000 chinook. Approximately 6,500 chinook caught in this area during May were landed in Oregon ports.

The all-species fishery, restricted to the area between Leadbetter Point and Cape Alava, opened July 15 and was closed after only four days when inseason information indicated the coho quota (78,500) would be exceeded. The total chinook catch was 11,300 fish, 30 percent less than the quota.

The one-day, all-species fishery on August 21 in the Columbia River catch area south of the red buoy line, was managed under harvest quotas for both chinook (2,700) and coho (10,000). The original fishery season schedule was shortened by the Council because of concerns for coho and the July fishery coho quota overharvest. The total chinook catch for the fishery was 1,000 fish.

Chinook impacts for the August 3 through August 31 pink salmon directed fishery, north of Carroll Island, were expected to be primarily sublegal sized fish killed as a result of hook and release. The total allowable impact was 5,100 chinook including a harvest quota of approximately 960 legal sized chinook. Following the July non-treaty troll all-species fishery, the Council adjusted the chinook allowable impact, for quota underharvest and for the quota exchange with the recreational fishery (750 chinook for 3,000 coho). The final chinook harvest quota was 1,720. The low availability of pink salmon, especially to the day boat portion of the troll fleet, resulted in a portion of the troll fleet concentrating effort on harvest of chinook salmon. This activity was considered to be contradictory to the intentions and objectives of this fishery. The State of Washington, in consultation with the National Marine Fisheries Service, imposed a landing restriction of not more than one chinook per each twenty pink salmon on August 22. Total landings of chinook amounted to 3,900. Sublegal mortalities were estimated at 1,200, calculated on the basis of sublegal chinook incidence from a 1983 pink fishery study (Washington Department of Fisheries [WDF], 1984) and an assumed mortality rate of 30 percent. High incidence of sublegal chinook was anticipated with use of bare, blued hooks as terminal gear.

The season total chinook harvest, including hooking mortalities in the pink fishery, was 44,400, more than three times the 1984 catch, but only 16 percent of the 1971-1975 average catch.

Treaty Indian Troll - The treaty Indian troll fishery in ocean waters opened May 1, the beginning of the chinook quota accounting period with a May to September chinook quota of 10,500 fish. The total catch by treaty Indian troll fisheries during the summer season was 12,000 chinook, 1,500 fish in excess of the quota amount.

Recreational - Recreational chinook fishing in the area north of Cape Falcon was managed on the basis of subarea catch quotas, defined by recent historic catch sharing of coho and the expected number of chinook needed to catch the established coho quotas. Generally, the number of chinook allocated to subareas was insufficient to harvest the total coho allocation given average species composition of the catch. Regulations expected to reduce chinook catch rates were adopted and differed by subarea. For the Columbia River area, fishing was closed between Klipsan Beach and the red buoy line; for the Westport area, fishing was allowed only outside a three-mile demarcation; for the Neah Bay-LaPush area, the daily bag limit was restricted to allow not more than one chinook.

Several inseason regulatory actions were undertaken by the states and Council within the range of options described by the Council (see 1985 regulations, special note to Table 2 on inseason management). In the Neah Bay-LaPush area, on July 23, an area extending approximately one mile offshore was closed to all salmon fishing in response to high chinook harvest rates. Following the July troll fishery (July 15 through July 18), the Council modified the chinook

and coho quotas for this area, reducing the coho amount by 3,000 and increasing the chinook quota by 750 fish. This action involved a transfer of chinook from the troll fishery quota in exchange for coho from the sport quota. Effective August 15, chinook retention was disallowed, and impacts on chinook salmon were estimated on the basis of angler effort and the most recent sampling information on chinook incidence in the catch. The total chinook catch for this area was 2,400 and the hook-and-release mortality is estimated to have been 200 chinook. The total impact was 2,600 chinook, approximately 200 fish in excess of the quota.

Inseason regulation activity in the Westport area, directed at management of chinook, was limited to the single act of relaxing the three-mile fishing restriction prior to the Labor Day weekend (effective August 30). As in the other recreational fishing areas during the 1985 season, fishing was restricted to five days per week, Sunday through Thursday. Effective August 30, this restriction was relaxed for the Westport area. The total catch of chinook in this area was 18,100 fish compared to the 23,300 fish quota.

No inseason regulation changes occurred for the Columbia River catch area. However, the catch of chinook in the Buoy 10-Megler Astoria bridge area (inside the Columbia River) for only the period August 18 through August 22 applied to the chinook quota for this ocean subarea. The fishery terminated on August 22, due to coho catch quota restriction. The total chinook catch in this area was 11,200 compared to the quota of 12,100, and included 2,100 chinook caught in the Buoy 10 fishery.

Columbia River Fall Chinook

Inside Fisheries - Columbia River fisheries which harvest significant numbers of fall chinook include the treaty Indian setnet fishery operating in the area between Bonneville and McNary dams, the non-treaty gillnet fishery operating in the area below Bonneville Dam, and the recreational fishery which harvests fall chinook throughout the mainstem from the river mouth (Buoy 10) to Priest Rapids Dam. Inside fishery harvest, escapement, and run-size data of Columbia River fall chinook stocks are presented in Appendix B, Tables B-16 through B-19.

Four stocks contribute significantly to the Columbia River fall chinook fisheries. The total 1985 Columbia River commercial harvest of the Lower River hatchery (LRH) stock was 20,400 adults, 49 percent lower than the 1984 harvest, and 44 percent of the average catch for the period 1979-1982. The harvest of Bonneville Pool hatchery (BPH) falls, the most critical stock for 1985 management, was 14,000 adult fish, compared to 27,200 caught in 1984 and an average of 57,000 adults for the period 1979-1982. The treaty Indian setnet harvest of BPH adults was 13,800. The harvest of upper river bright (URB) stock totaled 97,900 adults, including a non-treaty gillnet catch of 31,500 adults and a treaty Indian catch of 58,300 adults. The total harvest of naturally produced falls from the lower river was 4,500 adult fish, taken entirely by non-treaty fisheries.

The recreational fishery catch of adult fall chinook by stock was 5,600 LRH, 200 BPH, 8,100 URB, and 1,200 LRW, for a total of 15,300 adult fall chinook. The chinook catch in the Buoy 10 fishery was 2,700 adults (Table III-2).

Escapement - Escapement of Spring Creek hatchery adult fall chinook in the Bonneville Pool was 5,400 fish, 66 percent of the hatchery production goal (8,200). A preliminary estimate of BPH ocean escapement (inriver run size) is 33,000, 11 percent lower than the preseason forecast (37,100). Unexplained loss of adults between Bonneville Dam and the hatchery facilities occurred at a greater than anticipated rate (65 percent versus the preseason expectation of 34 percent).

Overall escapement to hatchery facilities of the LRH stock was adequate to meet basic program needs. However, escapement goal shortfalls occurred at some stations including ODFW's Bonneville Hatchery. Total ocean escapement of the LRH stock was 108,300 adults, 25 percent greater than the preseason expectation (86,700).

Total ocean escapement of the lower river wild (LRW) stock was 13,100 adults, compared to 13,300 adults returned in 1984 and the 1979-1982 average run size of 27,400.

Total ocean escapement of the URB stock in 1985 was 193,100 adults, a record high return, over two and one-half times the 1979-1982 average. The escapement of URB adults measured at McNary Dam was 94,600 compared to the goal of 40,000 adults. A recreational fishery operating above McNary Dam harvested 5,100 adults. An experimental treaty Indian net fishery above McNary Dam harvested fewer than 20 chinook.

Goal Assessment

The preseason expectation for ocean escapement of Columbia River fall chinook stocks, given the Council-adopted seasons and harvest quotas, was sufficient to meet escapement requirements and thus the Council's management goals for natural stocks and the LRH stock. The expected return of the BPH stock was less than the amount required to meet basic hatchery program needs, given anticipated inriver fishery structure and anticipated harvest (see "PFMC Analysis of Impacts of Council Adopted Regulations," April 1985). The return of BPH adults to the river mouth was slightly less than the preseason expectation in spite of not achieving ocean fishery quotas. Unexplained inriver losses to non-fishery causes were greater than anticipated. The Council's goal for this stock was not achieved.

Upper Columbia River Spring and Summer Chinook

Inside Fisheries - The inriver run size of adult spring chinook destined for areas above Bonneville Dam in 1985 was 84,700 (Appendix B, Table B-13), a dramatic increase over the 1984 return of 47,400 and the recent five-year average of 58,200. Catches of adult upriver spring chinook in 1985 were limited to the non-target winter season (January through March) and amounted to only 1,200 in the lower river commercial, 300 in the recreational and 100 in the treaty Indian commercial fisheries. An estimate of the 1985 treaty Indian ceremonial and subsistence catch of this stock was 3,500.

Major fisheries for summer chinook in the Columbia River have been eliminated in recent years due to the chronic depressed status of this stock. Approximately 700 adult summer chinook were harvested incidental to treaty commercial fisheries targeted on sockeye. No catch of summer chinook was reported for the treaty Indian ceremonial and subsistence fishery in 1985.

Escapement - The Bonneville Dam escapement of 83,100 upriver spring chinook adults is 78 percent above the 1984 escapement and 47 percent above the recent five-year average. However, it is 17 percent below the lower end of the escapement goal range of 100,000 to 120,000 adults (Appendix B, Table B-15).

Escapement of upper Columbia River summer chinook, measured as the count of adult fish passing Bonneville Dam minus any mainstem commercial harvest above Bonneville Dam, was 23,600, 5 percent above the 1984 escapement and 98 percent of the 1979-1982 average escapement.

Goal Assessment - The upper Columbia River natural spawning stocks of spring and summer chinook continue to be depressed, having ocean escapements significantly below the spawning escapement goals. The Council's ocean fishery management plan objective for these far-northerly migrating stocks is essentially to not increase the rate of harvest within the Council jurisdiction. This goal was achieved in 1985.

Lower Columbia River Spring Chinook

Inside Fisheries and Spawning Escapement - The 1985 minimum run size of lower river spring chinook was 87,100, slightly less than the 1979-1982 average return of 91,800 adult fish but 23 percent less than the 1984 return (Appendix B, Table B-14). Lower river commercial fisheries in the winter season are primarily designed to harvest surplus abundance of the earlier returning segments of runs destined for areas below Bonneville Dam and to provide protection for depressed upper river runs. Winter season commercial landings were 12,800 adult fish, of which 11,600 were estimated to be of lower river origin. The winter season lower river recreational fishery landed 1,400 adult fish, 1,100 of which were lower river stock origin. No commercial or recreational fisheries were authorized during April through May to protect depressed upriver runs.

Tributary returns to the Willamette and Cowlitz rivers in 1985 totaled 57,100 and 11,400 fish, respectively. The Willamette Falls escapement was 34,500 fish and hatchery returns in the Cowlitz River totaled 6,800 adults.

Goal Assessment - The Willamette Falls escapement of 34,500 was within the escapement goal range of 30,000 to 35,000. The Cowlitz River Hatchery goal of 4,500 adults was exceeded by 2,300 adults.

Willapa Bay Chinook

Inside Fisheries and Spawning Escapement - Run size, harvest, and escapement data for Willapa Bay chinook are presented in Appendix B, Table B-21.

The summer commercial net season for sturgeon and non-local chinook was curtailed again in 1985 in response to low predictions for Bonneville Pool hatchery chinook which contribute to this fishery. This resulted in a catch

of only 150 chinook compared to 400 in 1984 and the 1971-1975 average of 4,500. No directed fishery for local chinook was allowed and coho openings were adjusted to minimize chinook impacts. Catches of local stocks totaled 8,450 chinook compared to 3,700 in 1984.

Escapement to hatchery facilities of Willapa Bay chinook was 6,100. The estimate of strays to natural spawning areas is unavailable.

Goal Assessment - The hatchery egg take was approximately 10 percent below the goal, but was above the recent year average. The Council did not specifically address this stock in 1985 planning.

Grays Harbor

Inside Fisheries and Spawning Escapement - Run size, harvest, and escapement data for Grays Harbor chinook are presented in Appendix B, Table B-23.

Spring and summer chinook fishing was limited in 1985 with virtually no catch by the Chehalis tribe, the main harvesters of this stock.

The non-local chinook fishery was restricted again in 1985 for protection of the BPH fall chinook stock.

No directed fishery occurred on local Grays Harbor fall chinook stocks. Catches were limited to incidental amounts associated with treaty Indian coho fisheries and treaty and non-treaty chum fisheries. Approximately 5,800 chinook were taken including 100 in the non-treaty net fisheries; 5,300 in the treaty fisheries; and 400 in the Chehalis tribal fishery. This total compares with 1,500 chinook harvested in 1984 and a recent five-year average catch of 5,800 chinook.

Natural spawning escapement estimates for these stocks are not available at this time.

Goal Assessment - Qualitative estimates for spring and summer chinook suggests a continuation of the improved escapements observed in recent years though it is likely the escapement is below the goal. Preliminary survey data for fall natural stocks suggest that the escapement will be below the goal.

Washington North Coastal Chinook

Inside Fisheries and Spawning Escapement - Historic run size, harvest and escapement data for chinook in Washington coastal rivers are presented in Appendix B, Tables B-26 and B-27. Naturally spawning chinook stocks originating in the Queets, Hoh and Quillayute rivers are managed under inriver exploitation rate harvest regimes that are constrained by minimum escapement levels. Details of the river management regimes are summarized in the footnotes of Appendix B, Table B-26 and B-27.

Quinault River - A small run of naturally spawning spring and summer chinook entered the river from April through July after which hatchery fall chinook predominated. The treaty Indian gillnet catch of spring and summer

stock, which is caught incidentally in fisheries directed at other species, was approximately 100 fish, less than 1984 catch of 200 and the recent five-year average catch of 200 (Appendix B, Table B-28).

The 1985 harvest of fall chinook in the Quinault River was targeted on hatchery production with the treaty Indian gillnet fishery harvesting fall chinook from early August through early October. Season total catch was 4,800, nearly identical to the recent five-year average catch (5,000).

Estimates of escapement of Quinault River chinook are presently unavailable.

Queets River - The treaty Indian gillnet fishery harvested less than 200 spring and summer chinook in an intermittent fishery operating a maximum two days per week. This fishery targeted on summer steelhead. The river sport fishery took a projected 75 spring and summer chinook.

Fall chinook were harvested in conjunction with fall coho beginning September 1. Stock size was evaluated inseason during late September through mid-October by a four to five day per week treaty Indian gillnet fishery. The inseason run was estimated to be 5,400 natural and 700 hatchery chinook. Indian gillnet catch was 1,500 and the river sport harvest was approximately 200.

Escapement of Queets River natural spawning spring and summer chinook is preliminarily estimated to be 900 fish, slightly less than the 1980-1984 average escapement of 1,000 fish.

The estimate of Queets River fall chinook natural spawning escapement is 3,900 adult fish, slightly above the recent five-year average of 3,600 adults.

Hoh River - The abundance estimate of spring and summer chinook was updated inseason by the Indian gillnet fishery. The estimated run size of the natural stock was 1,700 adults. Season total Indian gillnet catch was 300 adults taken in a season-long fishery ranging from one to two days per week. The river sport fishery harvested approximately 200 adults.

Management of fall chinook was also based on an inseason abundance update provided by the Indian gillnet fishery. Estimated run size from this process was 3,600 natural and 100 hatchery chinook. The tribal gillnet commercial fishery caught 1,100 in a season-long fishery operating from two to five days per week. The river sport fishery catch was projected to be 200 adult fall chinook.

Escapement of naturally spawning spring and summer chinook is estimated at 1,100 adults, about 20 percent less than the 1980 through 1984 average of 1,400 adults. The fall chinook natural escapement is projected to be 2,300 adults, about 18 percent less than the recent five-year average of 2,800 adults.

Quillayute River - Historically, few natural chinook were harvested in the Quillayute system prior to July. Recent year catches prior to July reflect hatchery production of spring chinook from Sol Duc Hatchery. Preseason estimates of abundance indicated all returning spring chinook were needed for brood stock purposes and no fisheries harvesting adults were allowed prior to

July 1. After July 1st the treaty Indian gillnet fishery operated two days per week through August. Season total commercial gillnet catch of summer chinook was 100 fish and the river non-treaty sport catch was less than 50 fish.

The fall chinook run size in the Quillayute River was updated in September using the Indian gillnet fishery. The estimated terminal run size was 8,300 including 8,100 natural fish. The season total Indian gillnet harvest was 2,400 adults taken in a fishery operating two to five days per week. This catch was identical to the recent five-year average catch. The river sport fishery catch was approximately 300 adult fish.

Natural spawning escapement of spring and summer chinook is estimated at 600 adults, equal to the record low escapement of 1984. Hatchery escapement is estimated at 300 fish which is less than the 1984 escapement but about equal to the 1980-1984 average escapement.

A preliminary postseason estimate of fall chinook natural spawning escapement in the Quillayute River system is 5,500 adult fish, 40 percent below the 1984 escapement of 9,100 and 13 percent below the 1980-1984 average escapement of 6,300 adults.

Goal Assessment - Spawning escapement goals for all natural Washington coastal chinook stocks were achieved with the exception of Quillayute spring and summer stock. The hatchery escapement goal for Quillayute spring chinook was achieved. The hatchery egg take goal for Sol Duc hatchery fall chinook (200,000 eggs to provide a marked indicator group) was not achieved. Quinault hatchery fall chinook egg take goals were not achieved.

The Council's ocean fishery management plans for the 1985 season did not address these (northerly migrating) chinook stocks directly.

Puget Sound

Inside Fisheries and Spawning Escapement - Historical Puget Sound commercial and recreational chinook catch and escapement are presented in Appendix B, Tables B-29 through B-31. Catches include some fish of non-Puget Sound origin. The commercial net fishery harvest of chinook inside Puget Sound totaled 224,300, approximately 2 percent less than the 1984 harvest and about equal to the 1976-1980 average catch of 229,600 chinook. The non-treaty harvest was 72,900 chinook, nearly equal to the 1984 catch of 73,500 and 30 percent less than the average catch for the period 1976-1980. The treaty Indian chinook harvest was 151,400, 3 percent greater than the 1984 harvest and 31 percent greater than the average catch for the 1976-1980 period. Treaty Indian troll catch inside Puget Sound (not including area 4B) was 4,900 chinook. Estimates of Puget Sound marine recreational and freshwater chinook catch for 1985 are not available at this time.

Estimates of Puget Sound chinook natural spawning escapement are not available at this time. The combined stock hatchery escapement was 43,100 adults, 22 percent less than the escapement of 1984 and 7 percent below the 1980-1984 average hatchery escapement of 46,100.

Goal Assessment - As stated in the management goal section, regulation of ocean fisheries off the coast of Washington and Oregon north of Cape Falcon has a relatively minor impact on Puget Sound chinook abundance overall. Puget Sound hatchery chinook escapement goals were achieved in 1985.

Coastwide Goal Assessment Summary

A summary of 1985 performance for chinook salmon by river system and stock in relation to escapement goals is presented in Table II-5.

Table II-5. Summary of 1985 performance for chinook salmon by river system and stock in relation to escapement goals (1985 data preliminary).

System	1985 Goal	Was goal met in 1985?
1. Sacramento River Chinook	122,000-180,000 natural and hatchery adults.	Yes. Escapement of 204,700 adults was 14 percent above the upper end of the range.
2. Klamath River Fall Chinook	Ocean escapement to average 68,900 adults during 1983-1986 or 87,200 during 1985-1986.	No. Ocean escapement was 59,300 adults, or 86 percent of the 1983-1986 average goal and only 68 percent of the 1985-1986 average required. Escapement during 1986 must be 115,100 to meet the current rebuilding goal.
3. Oregon Coastal Chinook	Escapement of 150,000-200,000 naturally spawning adults.	Yes overall, but some southern Oregon stocks still depressed.
4. Columbia River:		
Upper River Fall Chinook (Brights)	Escapement of 40,000 adults above McNary Dam, plus meet treaty obligations.	Yes. McNary Dam escapement was about 94,600, or 237 percent of goal.
Bonneville Pool Fall Chinook	Meet Spring Creek Hatchery goal of 8,200, and meet treaty obligations.	No. Lower than anticipated inriver run size and higher rate of loss above Bonneville Dam combined to reduce hatchery escapement to 5,400.
Upper River Spring Chinook	Escapement of 100,000-120,000 adults above Bonneville Dam (not attainable) plus meet treaty obligations. Escapement of 30,000 minimum to Snake River.	No. Bonneville Dam escapement was 83,100, or 83 percent of the lower end of the range. Snake River escapement was 25,200, or 84 percent of goal.
Upper River Summer Chinook	Escapement of 80,000-90,000 adults above Bonneville Dam (not attainable) plus meet treaty obligations.	No. Bonneville Dam escapement was 23,600, 30 percent of the lower end of the range, but was above the 22,400 in 1984.
Lower River Spring Chinook (Willamette)	Escapement of 30,000-35,000.	Yes. Escapement of 34,500, fell within the escapement goal range.
5. Washington Coastal Fall Chinook	Meet natural spawning escapement objectives and treaty obligations.	Egg take goals were not met on Willapa and not met on Quinault. Escapement objectives for Queets, Hoh, and Quillayute natural runs met. Data not available for Grays Harbor stocks. Data necessary for allocation determinations not yet available.
6. Washington North Coastal Spring/Summer Chinook	Meet natural spawning escapement objectives and treaty obligations.	Escapement objectives for Queets and Hoh met; not met for Quillayute and Grays Harbor stocks. Data necessary for allocation determinations not yet available.
7. Puget Sound Chinook	Minor part of Washington ocean harvest and PFMC ocean management not directed towards these stocks.	